# UNITED STATES PATENT AND TRADEMARK OFFICE

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 09/900,618 | 07/06/2001 | Ambatipudi R. Sastry | SRI-010A | 6069 |

| 52197 | 7590 | 08/16/2005 |
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| EXAMINER |
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| ART UNIT | PAPER NUMBER |
|---|---|
| 2666 | |

DATE MAILED: 08/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

PTO-90C (Rev. 10/03)

| | Application No. | Applicant(s) |
|---|---|---|
| **Office Action Summary** | 09/900,618 | SASTRY ET AL. |
| | Examiner | Art Unit | |
| | Puneet Bhandari | 2666 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

## Status

1)☒ Responsive to communication(s) filed on <u>06/01/2005</u>.

2a)☒ This action is **FINAL**.          2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

4)☒ Claim(s) <u>1-14 and 17-21</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>1-14 and 17-21</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

## Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are:  a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All  b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1)☒ Notice of References Cited (PTO-892)
2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____ .
5)☐ Notice of Informal Patent Application (PTO-152)
6)☐ Other: _____.

## DETAILED ACTION

### *Claim Objections*

1.      Claims **1, 17 & 20** are objected to because of the following informalities:

Regarding claim **1**, an objection is made to the use of phrase "capable of" on

line 3. The use of this phrase is an optional language (see MPEP-2106.II.C).

Regarding claim **17**, an objection is made to the use of phrase "capable of" on

lines 1 & 7 respectively. The use of this phrase is an optional language (see MPEP-

2106.II.C).

Regarding claim **20**, an objection is made to the use of phrase "capable of" on

line 3 respectively. The use of this phrase is an optional language (see MPEP-

2106.II.C).

Appropriate correction is required.

### *Claim Rejections - 35 USC § 102*

2.      The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3.      Claim **1-3, 5-9 13-20 & 21** are rejected under 35 U.S.C. 102(e) as being

anticipated by Li et al. (US 6,738,819).

Regarding claim **1**, In a network comprising a plurality of router nodes connected in the network by communication links is anticipated by *"routers connected in network by communication links"* as disclosed in column 4, lines 20-25 or Fig 1; a method of providing quality of service assurances for transmitting packets over a channel capable of transmission at nominal bandwidth is anticipated by *" link bandwidth is allocated to each service type, based on specified policy (Quality of Service)"* as disclosed in column 4, lines 30-31;the method comprising:

Defining a plurality of classes, each of the class representing an aggregate behavior of packets is anticipated by *"service classes Best Effort (BE), Expedited Forwarding (EF) and Assured Forwarding (AF)"* disclosed in column 4, lines 25-28 or Fig 2.

Allocating to each of the classes a nominal departure rate (admit limit) at which the packets of that class are transmitted when the available bandwidth of the channel is substantially operating at the nominal bandwidth is anticipated by *" EF service is given a of the total bandwidth, AF service is given b of the total link bandwidth and BE service is given c of the total bandwidth"* disclosed in column 4, lines 30-34.

Assuring each of the classes a minimum allocation of the available bandwidth for transmitting packets of that class if the available bandwidth of the channel is less than the nominal bandwidth is anticipated by *"maximum allowable capacity will be lower than allocated bandwidth"* disclosed in column 4, lines 40-43.

The limitation at least one of the nominal departure rate and minimum allocation is dynamically changeable is anticipated by admit limit (nominal departure rate) is updated periodically as disclosed in column 5, lines 50-55.

Regarding claim **2,** wherein step of assuring a minimum allocation to each class comprises assigning a percentage to each of the classes that represent a minimum percentage of available bandwidth that is allocated to that class is anticipated by " $R_{max}$ *is the minimum percentage of the allocated bandwidth"* disclosed in column 4, lines 40-47.

Regarding claim **3,** wherein the minimum allocation assured to the classes are proportionally different than the nominal departures rates allocated to the classes is anticipated by "up to a predetermined bandwidth utilization capacity" disclosed in column 4, line 38-40.

Regarding claim **5,** wherein nominal departure rate assigned to each classes by a given router nodes is a percentage of nominal bandwidth of an outgoing communication link of that router node is anticipated by " 50% of the link capacity is allocated to assured forwarding services (AF)"disclosed in column 4, line 65.

Regarding claim **6,** wherein a given router has plurality of outgoing communication links and a nominal departure rate allocated to a given class is different for different outgoing link is anticipated by *"OC3 and OC12 link connected to router node 1 (since OC12 and OC3 have different bandwidth assignment the departure rate allocated based on percentage of bandwidth of OC3 AND OC12 would be different)"* disclosed in Fig.3.

Regarding claim **7**, wherein the nominal departure rate allocated to a given class is different for different router nodes is anticipated by *"OC3 and OC12 link connected to router node 1 (since OC12 and OC3 have different bandwidth assignment the nominal departure rate allocated based on percentage of bandwidth reserved for a given class would be different for different router nodes)"* disclosed in Fig.3 and Fig.2

Regarding claim **8**, wherein a given router has plurality of outgoing communication links and nominal departure rate allocated together with assured minimum allocation allocated to a given class is different for a given class is different for different outgoing communication link is anticipated by *"OC3 and OC12 link connected to router node 1 (since OC12 and OC3 have different bandwidth assignment the nominal departure rate allocated and assured minimum allocation is based on percentage of bandwidth reserved for a given class would be different for different out going communication links)"* disclosed in Fig.3, Fig.2 and column 4, lines 35-40.

Regarding claim **9**, wherein the nominal departure rate allocated together with assured minimum allocation allocated to a given class is different for different router nodes is anticipated by *"OC3 and OC12 link connected to router node 1 (since OC12 and OC3 have different bandwidth assignment the nominal departure rate allocated and assured minimum allocation is based on percentage of bandwidth reserved for a given class would be different for different out going communication links)"* disclosed in Fig.3, Fig.2 and column 4, lines 35-40.

Regarding claim **13,** method further comprising assigning scheduling priorities to each of the classes based on criterion is anticipated by *"service classes Best Effort*

*(BE), Expedited Forwarding (EF) and Assured Forwarding (AF)"* disclosed in column 4, lines 25-28 or Fig 2.

Regarding claim **14**, method wherein the criterion is the delay that each class can tolerate is anticipated by *"service classes Best Effort (BE), Expedited Forwarding (EF) and Assured Forwarding (AF)"* disclosed in column 4, lines 25-28 or Fig 2.

Regarding claim **17**, Fig. 3 anticipates, a network, a router node capable of supporting differentiated services. Further the router node comprising:

A classifier defining plurality of classes, each of the classes representing an aggregate behavior of packets is anticipated by *""service classes Best Effort (BE), Expedited Forwarding (EF) and Assured Forwarding (AF)"* disclosed in column 4, lines 25-28 or Fig 2.

An allocater allocating to each of the classes a nominal departure rate (admit limit) at which the packets of that class are transmitted when the available bandwidth of the channel is substantially operating at the nominal bandwidth is anticipated by *"EF service is given a of the total bandwidth, AF service is given b of the total link bandwidth and BE service is given c of the total bandwidth"* disclosed in column 4, lines 30-34.

A rate prioritizer assigning to each of the classes a minimum allocation of available bandwidth for transmitting packets of that class if the available bandwidth of that channel is operating at less than the nominal bandwidth to provide quality of service assurances for transmitting packets over the network is anticipated by *"$R_{max}$ is the minimum percentage of the allocated bandwidth"* disclosed in column 4, lines 40-47.

The limitation at least one of the nominal departure rate and minimum allocation is dynamically changeable is anticipated by admit limit (nominal departure rate) is updated periodically as disclosed in column 5, lines 50-55.

Regarding claim **18**, router node further comprising a plurality of outgoing communication links and a nominal departure rate allocated to a given class is different for different outgoing link is anticipated by *"OC3 and OC12 link connected to router node 1 (since OC12 and OC3 have different bandwidth assignment the departure rate allocated based on percentage of bandwidth of OC3 AND OC12 would be different)"* disclosed in Fig.3.

Regarding claim **19**, router node further comprising a plurality of outgoing communication links and nominal departure rate allocated together with assured minimum allocation allocated to a given class is different for a given class is different for different outgoing communication link is anticipated by *"OC3 and OC12 link connected to router node 1 (since OC12 and OC3 have different bandwidth assignment the nominal departure rate allocated and assured minimum allocation is based on percentage of bandwidth reserved for a given class would be different for different out going communication links)"* disclosed in Fig.3, Fig.2 and column 4, lines 35-40

Regarding claim **20**, an article of manufacture having computer-readable program means embodied thereon for providing quality of service assurances for transmitting packets over a channel capable of transmission at nominal bandwidth is anticipated by *" link bandwidth is allocated to each service type, based on specified policy (Quality of Service)"* as disclosed in column 4, lines 30-31 the article comprising:

Computer-readable medium for defining plurality of classes, each of the classes

representing an aggregate behavior of packets is anticipated by "*service classes Best*

*Effort (BE), Expedited Forwarding (EF) and Assured Forwarding (AF)*" disclosed in

column 4, lines 25-28 or Fig 2.

Computer-readable medium for allocating to each of the classes a nominal

departure rate at which the packets of that class are transmitted when the available

bandwidth of the channel is substantially operating at the nominal bandwidth is

anticipated by "*EF service is given a of the total bandwidth, AF service is given b of the*

*total link bandwidth and BE service is given c of the total bandwidth*" disclosed in

column 4, lines 30-34.

Computer-readable medium for assuring to each of the classes a minimum

allocation of available bandwidth for transmitting packets of that class if the available

bandwidth of that channel is operating at less than the nominal bandwidth to provide

quality of service assurances for transmitting packets over the network is anticipated by

"*$R_{max}$ is the minimum percentage of the allocated bandwidth*" disclosed in column 4,

lines 40-47.

The limitation at least one of the nominal departure rate and minimum allocation

is dynamically changeable is anticipated by admit limit (nominal departure rate) is

updated periodically as disclosed in column 5, lines 50-55.

Regarding claim **21**, the limitation dynamically changing said at least one of the

nominal departure rate (admit limit) and the minimum allocation in response to change

in condition of at least one of the said communication link is anticipated by admit limit of

a link is changed whenever additional traffic is admitted on the link as disclosed in

column 5, lines 57-67.

## *Claim Rejections - 35 USC § 103*

4.      The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5.      Claim **4** is rejected under 35 U.S.C. 103(a) as being unpatentable over Li et al

(US 6,738,819) in view of Nandy et al. (US 6,646,988). Li et al (US 6,738,819) teaches

all the limitation of claim 1 (see 102 rejection for claim 1 above) except Li et al (US

6,738,819) does not expressly disclose establishing drop precedence for each of the

classes to determine a priority for dropping packets of that class. Nandy et al. (US

6,646,988) discloses drop precedence level for dropping packet (see column 7, lines

60-67). At the time invention was made, it would have been obvious to a person in

ordinary skill in art to add drop precedence level of Nandy et al. (US 6,646,988) to Qos

method of Li et al (US 6,738,819). One ordinary skill in art would have been motivated

to do this to perform traffic conditioning based on knowledge of target rates (see column

7, line 25-26 of Nandy et al. (US 6,646,988)).

6.      Claim **10-12** are rejected under 35 U.S.C. 103(a) as being unpatentable over Li

et al (US 6,738,819) in view of Aatresh (US 6,067,301).

Regarding claim **10**, Li et al (US 6,738,819) teaches all the limitation of claim 10

(see 102 rejection for claim 1 above) except Li et al (US 6,738,819) does not expressly

disclose dropping of packets from the queues to limit the delay at a given router node. Aatresh (US 6,067,301) discloses packet being dropped due to congestion (see column 1, lines 45-50). At the time invention was made, it would have been obvious to a person in ordinary skill in art to add dropping of packets from the queues to limit the delay at a given router node as indicated by Aatresh (US 6,067,301) to QoS method of Li et al (US 6,738,819). One ordinary skill in art would have been motivated to do this to provide higher QoS (see column 1, lines 26-30).

Regarding claim **11**, Li et al (US 6,738,819) teaches all the limitation of claim 11 (see 103 rejection for claim 10 above) except Li et al (US 6,738,819) does not expressly disclose method comprising attaining the minimum allocations assured to each of the service classes by providing an alternate route for the packets of service classes in accordance with the rate priorities assigned to the service classes. Aatresh (US 6,067,301) discloses prioritized distribution of excess bandwidth (alternate routes) (see column 8, lines 20-22). At the time invention was made, it would have been obvious to a person in ordinary skill in art to add method of providing an alternate route for the packets of service classes in accordance with the rate priorities assigned to the service classes to QoS method of Li et al (US 6,738,819). One ordinary skill in art would have been motivated to do this to for effective utilization of the given bandwidth (see column 8, line 22 of Aatresh (US 6,067,301)).

Regarding claim **12**, Li et al (US 6,738,819) teaches all the limitation of claim 12 (see 102 rejection for claim 1 above) except Li et al (US 6,738,819) does not expressly disclose communication link is wireless link. Aatresh (US 6,067,301) discloses

infrared/and or radio frequency links (see column 5, lines 50-55). At the time invention

was made, it would have been obvious to a person in ordinary skill in art to add the

wireless communication link to QoS method of Li et al (US 6,738,819). One ordinary

skill in art would have been motivated to do this to provide a medium for transferring

data packets (see column 5, lines 40-41).

### Conclusion

7.      Applicant's amendment necessitated the new ground(s) of rejection presented in

this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP

§ 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37

CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE

MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not

mailed until after the end of the THREE-MONTH shortened statutory period, then the

shortened statutory period will expire on the date the advisory action is mailed, and any

extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later

than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Puneet Bhandari whose telephone number is 571-272-

2057. The examiner can normally be reached on 9.00 AM To 5.30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Seema Rao can be reached on 571-272-3174. The fax phone number for

the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free).

Puneet Bhandari
Examiner
Art Unit 2666

D...G TON
PRIMARY EXAMINER